

CLAIMS

1. A phase shifting device for an array of antenna elements having respective antenna feed lines, formed on a printed circuit board, with respective open circuits formed therein, the device including a body slidable relative to the printed circuit board and carrying a plurality of conductive strips for forming an RF connection across respective open circuits, the strips being formed such that any given feed line is lengthened by movement of the body in one direction and shortened by movement in an opposite direction.
2. A device as claimed in claim 1 wherein the conductive strips are in the form of strips.
3. A device as claimed in claim 1 or claim 2 wherein the set of conductive strips is oppositely sensed from another set, such that on movement in the one direction the one set of strips move to lengthen their respective feed lines, whilst the other set shorten their respective feed lines.
4. A device as claimed in any one of the preceding claims wherein the conductive strips are capacitively connected to their respective feed lines.
5. A device as claimed in any one of the preceding claims wherein the body is a rigid RF transparent block.
6. A device as claimed in claim 5 wherein the conductive strips are printed, etched or formed on a surface of the block.
7. A device as claimed in claim 5 wherein the conductive strips are mounted on a circuit that is fixed to the block with the body of the circuit interposable between the block and the printed circuit board.
8. A device as claimed in any one of the preceding claims further including a low friction thin dielectric layer interposed between engaging surfaces of the board and the conductive strips.

9. A phase changing assembly including a printed circuit board for an array of antenna elements, the board having respective antenna feed lines formed thereon, each feed line having an open circuit formed thereon, a phase shifting device as claimed in any one of the preceding claims with the element slidably mounted with respect to the printed circuit board and an actuator for causing the slidable movement.

10. An assembly as claimed in claim 9 wherein the printed circuit board is elongate and the body is movable in a longitudinally axial path.

11. A ground tilting antenna array comprising an assembly as claimed in claim 10 as dependent on claim 3 wherein the antenna elements are mounted in a vertical elongate array with the upper antennae connected to feed lines where length is lengthened when the body is moved in the one direction and the lower antenna elements are connected to the feed lines whose length is shortened when the body is moved in the one direction whereby a phase shift is caused along the length of the array.